

denation," in its strictest sense, to be the removal of portions of the earth's surface by water, so as to expose to view the rocks previously concealed beneath that surface. He briefly adverted to the various effects produced by running water; but enlarged principally on the action of the sea—that being the principal agent employed in the destruction and reproduction of strata mechanically deposited in water. To show the bearings of this, he explained the action of the sea on certain coasts; showing the manner in which the breakers act on coasts composed of rocks of unequal hardness, and on others which, from the peculiar position of portions of their component strata, are more or less easily wasted by the waves. The manner in which a country is affected by these operations, according as it may be rising above or sinking beneath the waters, was expounded, and the processes by which the débris thus won from the land is spread abroad in the surrounding seas; showing that periods of slow depression are most favourable for the accumulation of great thicknesses of strata and the preservation of organic remains—the reverse being the case during periods of elevation. Mr. Ramsay applied these principles to explain the geological history of South Wales and the neighbouring counties, showing the amount of denudation that the rocks beneath the new red sandstone had suffered at various periods. This was illustrated by certain of the sections of the Geological Survey of Great Britain, drawn on a true vertical and horizontal scale of six inches to a mile. In these, the older disturbed rocks beneath the new red sandstone (viz. coal-measures, carboniferous limestone, old red sandstone and Silurian formations) were shown to have been all bent and contorted together. He explained the principles by which the curvatures of disturbed strata beneath the surface are deduced; and on these principles he had restored the curves that the same strata (once having, in these districts, been continuous) would follow if now joined above the existing surface of the land. This gave an approximation to the quantity of matter removed by denudation from above that surface—amounting over great part of the country to *ten or twelve thousand vertical feet of solid rock*; part of which, on the outskirts of Wales and in Somersetshire, was removed during the new red sandstone and liassic periods; and the greater part—viz. the interior of Wales—since the deposition of the London clay;—the seas of the oolite and cretaceous periods never having penetrated into the interior of Wales. It was during tertiary times that the removal of this great mass by sea denudation was effected; this denudation giving to the country its present contour of hill and valley.—*Athenæum*.

BOTANICAL SOCIETY OF EDINBURGH.

Feb. 11, 1847.—Dr. Greville, President, in the Chair.

The following communications were read:—

1. A letter from Capt. Portlock, giving a short account of his horticultural proceedings at Corfu, and suggesting the *Convolvulus Batatas*, or sweet potato, as a substitute for the potato; the plant has

been introduced into Corfu, and apparently with success. Capt. Portlock describes it as an excellent vegetable, being dry, and between the potato and parsnep in taste.

2. "On the Defoliation of Trees," by the Rev. Dr. Fleming. After referring to the extremely defective nomenclature connected with the "defoliation of trees" employed in the writings of Lindley, Gray, and others, the author called the attention of the Society to a classification of the phenomena which he had published in the 'Edinburgh Journal of Science' (Brewster) in Jan. 1826, and where leaves are arranged in reference to their duration into three groups—*Folium deciduum*, *Folium annuum*, *Folium perenne*. In the first class the leaves cease to exercise their functions when the buds have been perfected, and fall off in succession before winter; or, when the plant is trained as a hedge, they frequently remain until the evolution of the buds in the following spring. In the second class the leaves outlive the winter, and do not die or fall off until a number of new leaves have been evolved for the support of the plant in spring or summer. Such are the bay, laurel, holly and ivy, which are never without living leaves, while in the first class such leaves are periodically wanting. In the third class the leaves continue to exercise their functions for several years, as in the Firs, an arrangement in part connected with the ripening of the seeds. He then proceeded to expose the erroneous views of those who maintain that it is only the buds of a tree which are alive, and that its *timber* is dead, and destined to serve merely as a *soil* for the buds on their evolution in spring. He restricted his proofs to the leaves and branches connected with them which live throughout a succession of seasons—to the mode in which buds can be *forced*—and to the individual differences preserved, in the case of fruit-trees, between the stock and graft during the whole period of their connection.

3. "On *Carex saxatilis* (L.) and *Carex Grahmi* (Boott)," by Dr. Balfour, who endeavoured to show that intermediate forms exist which seem to connect the two species. He exhibited specimens picked on Ben na Cruichben, near Killin, in 1844, which showed characters partly of the one species and partly of the other; all gradations are found from the true form of *C. saxatilis* with its rounded or ovate, dark, erect spikes, ovate, beaked, emarginate perigynia slightly longer than the scale, to *C. Grahmi* with its oblong-ovate, somewhat nutant spikes, and bifurcate perigynia twice as long as the scales.

Dr. Balfour exhibited a series of American Ferns from Dr. Gavin Watson of Philadelphia, among which the following were the most interesting species and varieties:—*Cistopteris tenuis* of Schott, a variety of *C. fragilis*, and various intermediate forms; *Polystichum acrostichoides*, some specimens with rounded pinnæ, and others with the pinnæ much divided and deeply serrated—among the latter were several with the fructification extending to the lowest pinnæ; *Diplazium thelypteroides* of Presl, several with segments of the pinnæ very acute; *Lastræa spinulosa*, various forms, including *L. intermedia* of American botanists; *Lastræa lancastriensis*, a form approaching *L. cristata*, but apparently distinct: in some specimens the frond w

alternately pinnate, with the pinnæ approximated, cleft, or slightly pinnatifid, the segments rounded or slightly toothed; in others the pinnæ were deeply pinnatifid and much toothed, more or less acute; while in a third set the frond was bipinnate. Numerous intermediate forms were exhibited, showing the transition from the one to the other. *Athyrium Filix-femina* of Roth; of this fern a complete series was shown, connecting the typical form of the species with the various forms to which the names of *irriguum*, *angustatum* and *asplenoides* have been given by some botanists who regard them as distinct species.

Dr. Greville, who had carefully examined the specimens of the two last-mentioned ferns, was of opinion that *Lastræa lancastrimensis* is a good species, and that all the forms of *Athyrium Filix-femina* exhibited were referable to one species.

Dr. Balfour also showed specimens of *Hieracium rigidum*, var. *angustifolium*, from near Inversnaid, Loch Lomond; *H. prenanthoides*, Habbie's Howe, Pentland Hills; and *Mimulus luteus*, near an old reservoir, Pentlands. The last-named plant has now been found in several spots near Edinburgh; also on the banks of the Clyde near Glasgow; near Largs; in Perthshire, Stirlingshire and Aberdeenshire; near Morpeth and in South Wales. He also mentioned the discovery of *Achillæa tanacetifolia* in England.

March 11.—Professor Balfour in the Chair.

The following communications were read:—

1. "List of plants collected in the neighbourhood of Auchincarn, Kirkcudbrightshire, in July and August 1846," by W. Wells, Esq., communicated by Sir Wm. Jardine, Bart. The author enumerated the plants which he had noticed in the district named, among which were many rare and some interesting alpine species.

2. "Description of a new species of *Dawsonia*," by Dr. Greville. This splendid moss, of which a specimen and drawing were exhibited, has been named *D. superba* by Dr. Greville. It was received from Australia; the specimen exhibited was 14 inches high, with leaves fully an inch in length. [See p. 226 of the present Number.]

3. "Notice of Palms at present in flower in the Royal Botanic Garden," by Dr. Balfour. 1. *Livistona chinensis*, Mart. The plant in the garden is about thirty-six years old, 25 feet high, and the stem at the base has a diameter of 22 inches. The leaves are upwards of 13 feet long, and the blade of the leaf 7 feet across; the spadices 4 to 4½ feet long. It is believed that this is the first time the palm has flowered in Britain.—2. *Euterpe montana*, Graham, or Mountain Cabbage-Palm. The plant in the garden used to fruit regularly, but of late years no fruit has been produced, although it continues to flower abundantly. It is now 30 feet in height.—3. *Chamærops humilis*, or European Fan-Palm. It has for many years produced staminiferous flowers only, but this season produced staminiferous and pistilliferous flowers, and the fruit was apparently perfect.

4. Dr. Balfour stated that he had obtained information that the *Luzula nivea*, discovered last year in a wood near Broomhall by Dr. Dewar, had been planted there by the former gardener, so that it can have no claim to rank as a British plant.